

SCIENCE

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THE MEDICAL PRESS ON KOCH'S CURE.

The Epidemic of Kochism.

THE fact that the new and untried method of Koch produced an immediate and world-wide sensation is perhaps not to be wondered at, but it furnishes nevertheless a very interesting study. What might, for present purposes, be called the epidemic of Kochism, first appeared in Berlin at the time of the International Congress, but remained local and dormant for about three months, when it suddenly spread with increasing force and great rapidity, taking roughly the same course as the epidemic of influenza a year ago. It appeared in America, however, before it did in France, perhaps owing to the more positive and far-reaching ubiquity of our press. It has only lately begun to be felt in the far East and South. It is yet too early to say how long it will last, but it shows signs of waning in Germany. A well-marked feature of the epidemic is a sudden revival when the first consignments of "Kochine" reach a given locality. Members of the medical profession are generally attacked a little later than the laity, and often escape altogether, except when brought into the vicinity of newly arrived Kochine. Kochism produces certain typical symptoms in members of the medical profession who are unfortunate enough to be afflicted with the malady, but our study is limited to the laity, and in fact to one class of sufferers. The effects of the epidemic on the laity differ, and show marked characteristics in different classes, especially among newspaper reporters, members of phthisical families, and irregular practitioners, among whom, by careful search, may be found symptoms which are respectively ludicrous, pathetic, and disreputable.—*Boston Medical and Surgical Journal*, Jan. 15, 1891.

The Koch Remedy for Tuberculosis.

It is now about two months since Koch made the announcement of his "remedy" for tuberculosis, and it may be said to have had a fair opportunity to show what it would accomplish. Of course, there has not been time to show cures without possibility of recurrence,—years might not suffice for this,—but there has been plenty of time to show if it could produce improvement of steadily progressive character, and furnish ground for hope that eventually some form of tuberculosis would be, in a fair sense of the term, cured through its influence upon the human economy. Unfortunately, after all, it is impossible to say that the lymph can be relied upon for any of the purposes indicated by Koch in his first announcement. It is not a trustworthy means of diagnosis, nor a reliable remedy for any form of tuberculosis; while experience has demonstrated that it is dangerous when used either for diagnosis or for treatment. Professor Virchow, who has been making investigations on the lymph treatment,

last week asserted, after twenty-one *post-mortem* examinations of patients who had died after injection, that the Koch method is not what had been hoped or claimed for it, and that there can be no permanent benefit from it to the patient. The tubercle bacilli, he says, are not killed by the lymph, but are only driven out to take lodgement elsewhere. Thus, according to his theory, tuberculous affections, while they may disappear from one part of the body, break out in other places in as discouraging a form as ever. To this we may add that the phenomena of certain cases, in which it has been asserted that unsuspected tuberculosis of the lungs had been revealed by treatment with the lymph, warrant the belief that the lymph may set up a tuberculous process in persons entirely free from disease.—*Medical and Surgical Reporter*, Jan. 17, 1891.

Virchow and Koch.

There is probably no one living whose opinions are listened to with the same respect as are those of Virchow, who has been so correctly called the "father of modern pathology." The statements of this eminent man are also particularly interesting when they concern the new method of treating tuberculosis, and become still more important when they seem in any way opposed to the almost ecstatic reports of the physicians who have used the mystic liquid in Germany and elsewhere. The statements of Virchow, which are published in the *Extra* attached to this number of the *Medical News*, show that a possibility exists of a sad curtailment of our hopes for the relief of the "white plague," and emphasize the fact, that, do what we will, the mortality must go on unimpeded to a very great extent.—*Medical News*, Jan. 17, 1891.

The Lymph and its Re-actions.

The publication of Professor Koch regarding the composition of the lymph, considering the great expectations which have been aroused concerning it, is rather disappointing than otherwise. Aside from the mention of the ingredients contained in the fluid, we are in little, if any, better condition as to the possibility of its production in our own laboratories than we were before. Still the information, as far as it is given, will add much interest to the study of the results of lymph treatment in their relations to the supposed causes of their production: in other words, we are so much the better enabled to think for ourselves, and so much the more encouraged to work in accumulating data by which the new theory must stand or fall. We are making enough progress in the latter direction to take courage accordingly, and hope for the best in the direction of eventually settling many of the mooted points of a startling revolutionary doctrine.

Much of the interest of our investigations has centred upon the value of the re-actions, general and local, as diagnostic of tuberculosis in various parts of the body. Although the

re-actionary phenomena have been quite uniform, they have proved to be far from absolutely so.

Then as to the supposed mode of action of the lymph in destroying tuberculous tissue, or scattering the bacilli, there is opportunity for much difference in opinion. The doctrine of specific action is losing rather than gaining ground in the light of present clinical experience here and abroad. Fortunately, the autopsies have been few, and pathological opportunities have been limited. So far, there have been few lesions peculiar and striking enough to show any direct relations of cause and effect in the use of the remedy. Many observers have noted no changes whatever in tuberculous joints opened by surgical operation after the lymph has done its re-actionary work, while others have described degenerative changes which may or may not have existed before the inoculation treatment was commenced. The examinations of lung lesions have shown equally various conditions from that of limited areas of injection around decomposing tubercular masses, as usually seen in cases under ordinary treatment, to that of extensive infiltration of neighboring tissue. The latter phenomena have been described also in connection with tubercular diseases of the larynx, where suffocation has been thereby threatened, and particularly in cases of lupus, in which the turgidity of surrounding parts has been almost the rule, and has been associated with incrustation of the surface.

While such effects confirm the predictions of Professor Koch regarding local re-actions, and encourage further study, we have as yet made no notable progress in ultimately curing tuberculosis, or in proving that the lymph acts differently from any other substance containing an active albuminoid substance capable of producing systemic poisoning with local manifestations. Theorizing on this basis, it would be legitimate to assume that any organic poison similar to that which the lymph contains would attack most strongly a weakened body, such as we find in tuberculous patients. The parts invaded by a degenerative disease, and necessarily most lacking in vitality, would be the first to be affected. As a consequence, strong re-actions might easily occur in the shape of increased local congestions and infiltrations, with the usual attendant phenomena of an augmented general febrile disturbance. From such a standpoint it may not be difficult to understand how the tuberculous tissue as such might be killed independently of any elective action of the lymph.

At best, we must admit that the simple destruction of the diseased tissue, even if such can always be assured, is but a part of a very complex process of cure for tuberculous disease. Something more is required than mere injections and resulting re-actions.

While we may congratulate ourselves that we have even progressed thus far, we have scarcely taken more than a first step. Much more difficult tasks are the safe elimination of the rapid local decomposition occasioned by the lymph, and the subsequent reparation of the invaded parts. Already we are told that in cases of tuberculous joints and glands relief can be obtained ultimately by surgical measures only.

What becomes of the bacilli which are not directly affected by the lymph treatment is a question of considerable importance. The statement of Virchow, that when they are routed they are scattered in adjoining sound tissue, is doubtless backed by a careful and intelligent study of *post-mortem* appearances. Until, however, more definite facts than those already offered are given, it will be well to suspend judgment.—*Medical Record*, Jan. 17, 1891.

TREES IN LONDON.

FROM a sanitary point of view, it is generally held that trees are useful, though some maintain that near houses they are often harmful from their shutting out sunlight. Whatever may be the relative value of different views put forward, observations made within the last few years seem to establish the fact that within a five-mile circle from Charing Cross the amount of foliage is decreasing. Many of the main roads leading out of London have been planted with trees, and, largely through the influence of the Metropolitan Public Gardens Association, many open spaces have been beautified by foliage. But while the number of trees placed on public ground is increasing, both the number, and, through very close lopping, the size, of trees on private ground, are decreasing; and the gains are far outbalanced by the losses.

The losses may be grouped under two heads:—

1. The cutting-down of trees completely. This is mostly due to clearances for building; and within the five-mile circle the destruction of trees in pasture-lands is small, compared with the breaking-up of gardens. In many parts houses standing in from one to two acres of ground are demolished for rows, or closely packed semi-detached villas, and the gardens are destroyed to make way for them. Recent changes in the Herne Hill district are a good typical example of this. Where three years ago there were around country houses grounds rich with timber and fruit trees, are now roads closely built on either side, with a few square yards of front that might be effectively treated with tiles and small pattern "carpet bedding," but are not large enough for trees. Instances of this kind might be quoted from many districts around London. Again, the older roads of villas, that had some twenty-five to forty feet of garden between the front door and the gate, with more at the back, are in all parts little by little being bought up to make streets which have their frontage flush with the pavement, or a depth of some three to four feet, at the most, railed off. The miles of plain fronted brick terraces built from seventy to one hundred years ago are (probably as the leases run out) being replaced by rows with their front doors leading directly from the pavement. Architecturally there may be an improvement; but the gardens, which average about thirty feet in length, are lost. Front gardens are gradually disappearing from London, and with them go the trees that used to make the public ways so changeably pleasant from bright spring to rich tinted autumn.

2. In districts where gardens remain, there is a large increase in the cutting-down and close lopping of trees. It is difficult to assign the cause for this; but whatever the explanation, the fact remains that the trees, instead of being annually pruned, are suddenly lopped, till, in hundreds of cases, they are reduced to a trunk and a foot or two, or a few inches, of branch-stumps. Few trees grow symmetrically except when isolated, and even then prevailing winds have their influence; and in towns rows of buildings have an effect similar to copses and hill contours in protection. And in many cases around London there may be seen trees so carefully tended from year to year that they but little overhang flower-beds, grow well above the pavement, and yet do not look unnaturally distorted.

Many fine elms and spreading poplars and acacias may be seen, their trunks covered with ivy or other creepers, and the lower branches carefully removed, so that sunlight falls on the small garden, and the lower rooms have light. It would seem that want of management while trees are young is one of the causes of ignorant lopping being resorted to; and another, that forest-trees have been planted where fine-leaved and small-habit trees would have been more appropriate.

It can be easily observed that the increasing number of public trees are periodically attended to, while private trees are disappearing piecemeal, or being entirely swept away. London has, in the last few years, gained in planted open places; but the acreage does not equal the small lawns, grass-plots, shrubs, and trees lost.

A GENERAL exhibition of the Kingdom of Bohemia is to be held this year at Prague, this being the centennial jubilee of the first trades-exhibition on the continent at Prague, in 1791. The exhibition will last from May until the 15th of October, 1891.

LETTERS TO THE EDITOR.

. Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

The editor will be glad to publish any queries consonant with the character of the journal.

On request, twenty copies of the number containing his communication will be furnished free to any correspondent.

The Flight of Birds.

ONE would suppose that there could be little difference of opinion in regard to such fundamental principles of avian flight as the direction in which the down-stroke of the wings is delivered, and the relative positions to a horizontal plane of the anterior and posterior margins of the wings during this and the up-stroke. Nevertheless the other day I was completely astounded at some ideas expressed in "Animal Locomotion; or, Walking, Swimming, and Flying," by G. Bell Pettigrew, M.D., F.R.S., F.R.S.E., F.R.C.P.E., and connected with several other scientific and educational institutions (International Scientific Series, 1888).

Never having happened to see any review or remarks upon this remarkable work, I am in ignorance of how it has been received by the scientific world. To me it appears so completely illogical in parts, that I cannot refrain from presenting these remarks; so that, if I be as completely mistaken as to me appears to be this author, some one may kindly put me aright, that my ignorance of some fundamental points of aerostatics and animal mechanism may not vitiate my further observations in this line. It is with considerable diffidence that I venture to advance my opinion against that of one who has spent some twenty years upon the subject, and who, judging by the position that he occupies, certainly should be capable of coming to satisfactory conclusions on the subject; but my utter inability, after considerable study of the matter, to admit the possibility of what is given as the main principle of avian flight, induces me to bring the matter forward.

I will put the case in the author's own words, here as elsewhere, with his *Italics* (p. 197): "*Reasons why the effective stroke should be delivered downwards and forwards.*—The wings of all birds, whatever their form, act by alternately presenting oblique and comparatively non-oblique surfaces to the air,—the mere extension of the pinion, as has been shown, causing the primary, secondary, and tertiary feathers to roll down till they make an angle of 30° or so with the horizon, in order to prepare it for giving the effective stroke, which is delivered with great rapidity and energy, in a *downward and forward* direction." My first impression was that such a movement would drive the bird upwards and backwards, and subsequent study of the subject only makes me the more positive of this. Theoretically I believe that any body suspended in a fluid medium will tend to move in a direction opposite to that in which the medium is forced by the members of that body. Take a wing of a bird and vibrate it rapidly, as its movements are described by Dr. Pettigrew, before the flame of a candle, and we shall find that the flame is driven downward and forward.

On p. 95 we are told, "In the water the wing, when most effective, strikes *downwards and backwards*, and acts as an auxiliary of the foot; whereas in the air it strikes *downwards and forwards*." I fail to see why a movement that produces locomotion in one direction in water should be reversed in the air to produce locomotion in the same direction; and my mystification is increased when I read on p. 108, "Flight may also be produced by a very oblique and almost horizontal stroke of the wing, as in some insects, e.g., the wasp, blue-bottle, and other flies," for here I am left in doubt whether opposite directions of applying the wing produce the same direction of locomotion, or whether I am to believe that an "almost horizontal stroke of the wing" forwards produces a forward movement of the body. For the present I am inclined to believe neither the one nor the other. Again, on p. 204, in the explanation of Fig. 107, we read, "The Red-headed Pochard (*Fuligula ferina*, Linn.) in the act of dropping upon the water; the head and body being inclined upwards and forwards, the feet expanded, and the wings delivering vigorous short strokes in a downward and forward direction.—*Original.*" The questions presented to my mind by this are these: "Does the duck really wish to increase its speed just before alighting upon the water, or

does the fact of the strokes being 'vigorous short strokes' diametrically change their effect on the body from what would be produced by leisurely short strokes or vigorous long strokes?" I imagine that if the bird were in its right mind it would wish to check its course,—in other words, to give an upward and backward impulse to its body before coming in contact with the water,—and I should approve of its giving downward and forward strokes to its wings in order to accomplish this end.

Many other of Dr. Pettigrew's illustrations, both pictorial and verbal, also do violence to my ideas without convincing me: in fact, I seem to see exactly the opposite in them to what he has found. For instance: in Figs. 53 and 54, illustrating the action of the wing, the hinder edge of the wing must be below the anterior on the up-stroke and above it on the down-stroke, which is exactly the reverse of what he tells us occurs in flight. On pp. 156 and 157 we read, "It is a condition of natural wings; and of



FIG. 1 (FIG. 81 IN ORIGINAL).

artificial wings constructed on the principle of living wings, that when forcibly elevated and depressed, even in a strictly vertical direction, they inevitably dart forward. This is well shown in Fig. 81. If, for example, the wing is suddenly depressed in a vertical direction, as represented at *a b*, it at once darts downwards and forwards in a curve to *c*, thus converting the vertical down-stroke into a *down oblique forward stroke*. If, again, the wing be suddenly elevated in a strictly vertical direction, as at *c d*, the wing as certainly darts upwards and forwards in a curve to *e*, thus converting the vertical up-stroke into an *upward oblique forward stroke*. The same thing happens when the wing is depressed from *e* to *f*, and elevated from *g* to *h*." Admitted. But the posterior margin of the wing must be elevated during this movement, or one of two things must take place. If this margin be depressed, the wing will move in a contrary direction; i.e., backwards and downwards. If this does not take place, then force must be used which will cause an appreciable upward and

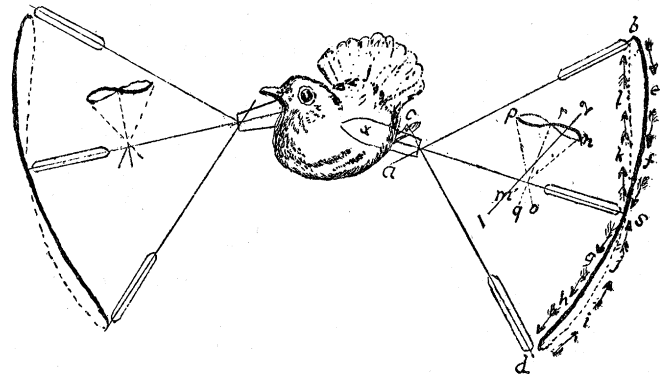


FIG. 2 (FIG. 116 IN ORIGINAL).

backward recoil to the hand moving the wing. In the same way the posterior margin of the wing will be lower than the anterior instead of above it, as the author states, during the upward stroke of the wing. Also I had imagined that the buoyancy and progression of a bird depended on the resistance that the wing encountered. If it be allowed to move in the plane of least resistance, it will move forward while the body remains stationary; whereas if not allowed to move forward, or forced slightly backward, then, and only then, can a forward impulse be given to the body. I might cite my personal observations of the movements of the wings of flying birds against the observations of Dr. Pettigrew; but in that case he would have in his favor the longer length of time during which his observations have taken place.

To draw the discussion to a close, which, if I am in the wrong, has sufficiently exposed my ignorance, I will call attention to Fig. 116. On p. 231 we read, "Instead of the two wings forming one

cone, the base of which is directed *forwards*, each wing of itself forms two cones, the bases of which are directed *backwards* and *outwards*, as shown at Fig. 116. In this figure the action of the wing is compared to the sculling of an oar, to which it bears considerable resemblance.¹ The one cone, viz., that with its base directed outwards, is represented at *x b d*. This cone corresponds to the area mapped out by the tip of the wing in the process of *elevating*. The second cone, viz., that with its base directed backwards, is represented at *q p n*. This cone corresponds to the area mapped out by the posterior margin of the wing in the process of *propelling*. The two cones are produced in virtue of the wing rotating on its root and along its anterior margins as it ascends and descends (Fig. 80, p. 149; Fig. 83, p. 158). The present figure (116) shows the double twisting action of the wing, the tip describing the figure of 8 indicated *a b c f g h d i j k l*; the posterior margins describing the figure of 8 indicated at *p r n*. We readily see that the cone *x b d* is formed by the downward or elevating stroke, the wing passing from *a b* to *x s* and *c d*. It is an elevating power both because of the direct lifting-power of the wing from *a b* to *x s*, and because of the action of the two wings on the wedge or cone of air formed by the line *c d* and its correspondent of the opposite side. In this case the wing is in each of its positions extended on the lines *a b*, *x s*, and *c d*. But I can't as readily explain the cone *q p n*. That this transverse section of the wing does not run parallel to the lines *o p*, *q r*, and *m n* if its edge be turned downward on the down-stroke and upward on the up-stroke, is evident. The down-stroke is the propelling one. Let us see how it produces the cone. I have added the line 1 2 to the figure to represent the position of a transverse section of the wing during its downward course. As we have been told that the primaries, secondaries, etc., roll down into this position upon the wing being extended, and as the wing is extended nearly at or upon the commencement of the down-stroke, we find that the plane of this section cuts the line *o p* at an angle of about 60°, the line *q r* at an angle of about 30°, and only becomes parallel to *m n*. Then here, as elsewhere, I have shown, we have very opposite causes producing the same effect. Now, let us see what really would be the result of this. We are told that the wing works upon compressed air, that "it produces a whirlwind of its own upon which it acts," etc. Let *q p n* represent, then, the cone of compressed air. The wing 1 2, cutting into this cone at the angle which it does, will of necessity be forced backwards towards the base *p r n*, instead of gliding along *o p*, as it would were its posterior margins elevated so that its plane lay in the direction *o p*. The same state of affairs, only reversed, would take place during the upward stroke of the wing.

In this discussion I have considered the wing as having a flat surface. That it is somewhat screw-shaped, i.e., twisted upon its axis, does not alter, so far as I can see, any of the principles here involved. It appears to me that during all of the discussion of flight Dr. Pettigrew has entirely failed to distinguish the difference between an active and a passive organ. In the inclination of the wings he has reasoned as though the air was acting on the wings instead of the opposite state of affairs, which occurs in active flight, where the wings act upon the air.

There are numerous other points in aerial, aqueous, and terrestrial locomotion where I cannot help thinking that our author has erred; but, as none of them involve such fundamental principles as have here been discussed, I will not now allude to them.

HENRY L. WARD.

Tacubaya, D. F., Mex., Dec. 30, 1890.

The American Idea of Architecture.

THE statement in a recent issue of the *Record and Guide*, that the dominant conditions of American architecture "are not those that make for the greatest beauty, or for the highest health, or for charm, but for the largest return in cash," is a most alarming indication of the estimation in which architecture is held in this country. Coming from so eminent a source, it carries additional weight, and shows very clearly that even those who by profession

¹ In sculling, strictly speaking, it is the upper surface of the oar which is most effective, whereas in flying it is the under."

are nominally responsible for all that is great or good, poor or indifferent, in the important art of architecture, have given up hope of elevating it to the broader platform which it occupied in past times; and surely, if the doctors have admitted the patient incurable, it is obviously unwise for an outsider to maintain the contrary.

This utterance of the *Record and Guide* is an admission from exalted quarters that in architecture all considerations must be sunk save those of dollars and cents. It shows, what indeed may be gathered any day in a brief walk through almost any street of our chief cities, that the idea of art quality, of utility, of the natural effects of the environment, and many similar causes whose influence is to be traced in all the good architecture of previous periods, are quite wanting in the art of the present day and generation. It is an indication of indifference to every thing but cost, of measuring art values and art qualities by the price per square inch, or, which is much the same thing, by the revenue per square foot,—most necessary to keep in mind, but altogether improper in judging of architectural merits. The point to be remembered is not the falseness of this criterion, not its absurdity, but the candid admission by an undisputed authority that it is the cardinal principle in American architecture, and that it is useless to contend against it. And, indeed, it might well be so; for if this idea has become firmly rooted in the minds of those who are concerned with architecture, who are erecting buildings as well as designing them, it is impossible to look for any better results than we have already obtained.

There is not only a popular misconception that architecture is a matter of cost, but also that it is concerned chiefly with the exteriors of buildings, and is not a science of plan, convenience, use, and similar influences. It is not the least surprising that a people who view their architecture through the medium of price should believe that the whole of it should be visible to the world at large in the exterior of their structures. That the American public is prone to judge of architecture by external æsthetic qualities is quite evident from the recent exhibition of the Architectural League in New York. This body is composed of the leading architects in the city, and its work is naturally the product of the best architectural culture in the country. Its annual exhibitions are looked upon by that section of the public interested in the serious treatment of architectural ideas as authoritative indications of whatever progress may have been made in American architecture during each year. Certainly the *personnel* of this society, and the names of those who send their work to its exhibitions, are sufficient justification for the estimation in which it is held. The exhibition that has just closed cannot be viewed as at all satisfactory to the public it was designed to instruct; and this, not because the work shown was of an inferior quality, not because it was lacking in firm, intelligent treatment, or was deficient in ideas, but because the drawings consisted solely of exteriors and picturesque effects.

It is not in the least critical of the work shown, to remark, that, in confining itself to these aspects of architecture, this important body of American architects has given its formal sanction to the idea that if a building looks well, all has been done that is needful to make it good architecture. On no other grounds does it appear possible to explain the predominance of exteriors in this collection. It is to be admitted that the artistic treatment of exteriors is one of the most important problems the architect has to deal with; but it is only one, and architecture has to do with many. It is not unreasonable to insist that it is quite as important to cover a given area well as to erect a façade that extends upwards into space for any desired distance. There is, however, a widely extended opinion that architecture is a matter of outsides, and is not at all of what is within. The outlook for American architecture is, in truth, discouraging when such a view receives the official support of an eminent body of architects.

It is not to be supposed that so advanced a journal as the *Record and Guide* should be backward in presenting the same idea. In a late issue it gave a review of the work done on the west side of New York, the seat of the most active building operations in the metropolis, in which, out of sixty-four illustrations, forty-nine were of exteriors, twelve bits of interiors, and three plans. It

would seem to be indisputable, then, that the American people are satisfied with their buildings if the outsides are good-looking. The structures illustrated in the *Record and Guide* include private residences, apartment-houses, hotels, warehouses, and churches, any one of which must have required some ingenuity in arrangement of plan, and have had some interesting constructive details, but they are carefully hidden from those who should be interested in these essential portions of architecture.

These indications of the tendency of American architecture show very clearly where the error is. The needs of the public are heeded in almost every phase of modern life and thought. The manufacturer and the shop-keeper, not less than the editor and the artist, are continually on the lookout for what the public wants, and hasten to supply them as soon as manifested. The public evidently want only exteriors in architecture. Plans, use, environment, and other matters which were once pre-eminent in the art, are now at a discount. Until the popular mind frees itself from such erroneous ideas, it will be impossible for the art to make any progress. It is well to remember that the general public which is satisfied with such things is more to blame for their continuance than the architects who prepare the designs; but it is a serious retrogression when the architects join the popular movement, and give their assent and support to it by catering to its most objectionable features.

BARR FERREE.

School of Architecture, University of Pennsylvania, Jan. 8.

Cyclones and Anticyclones.

It seems to me that the discussion in regard to the origin of cyclones and anticyclones that has been in progress in *Science* and other journals for several months past opens up a question that has so long been regarded as settled, that it seems impossible to look upon it as being in doubt. It is, in short, as to whether gravitation is the chief cause of movements of the air. Barometric observations have directed attention so forcibly to the relative weights of columns of air in storm-centres and elsewhere, that it has been assumed as a matter of course that the pressure gradients thus made manifest are the occasion of the horizontal movement apparent as wind. If this be the true explanation, in order that such horizontal movement may continue, it is necessary that there be a corresponding vertical movement, and that it be sustained by adequate renewal of the buoyancy of the air in the proper localities. This renewal of buoyancy can only be accomplished, so far as our knowledge at present extends, by heating. But now we are informed as a matter of fact that the air at anticyclonic centres descends in spite of its being warmer at an elevation, and in like manner above cyclonic centres fails to descend, although colder than at the surface of the earth. This certainly opens up the entire question as to whether there is ascensional movement at storm-centres commensurate with the extent and velocity of the winds blowing horizontally, and supposed to be due to an indraught; or, in other words, whether gravitation really plays the part that has been tacitly assigned to it, or whether it must be relegated to a subordinate position. Personally I am very glad indeed that a discussion having such bearings has come up at this particular juncture, because it has increased very decidedly my interest in following certain clues that look promising in regard to the effects of variations of the earth's magnetic condition as a whole.

M. A. VEEDER.

Lyons, N. Y., Jan. 5.

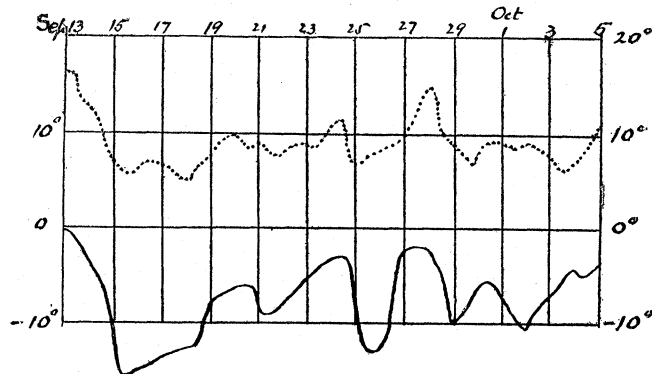
Dr. Hann and the Condensation Theory of Storms.

THE time has not yet come for a review of the various discussions upon this subject that have been published during the past four years. I doubt if there has ever been a better illustration, in the history of meteorology, of the absolute necessity there exists of appealing to observations in order to establish intricate theories, than the recent discussions on the reversal of temperature in our storms and "highs," which is but another way of putting the problem before us. In this very line Professor Davis says (*Science*, Jan. 2), "Records of temperature made on high mountain-peaks furnish the best means of testing the convectional theory of cyclones; for, even if all other tests were successfully borne, failure

under this test would be fatal to the theory." This statement of the case should be received with a little caution, however, because the presence of the mountain must be a modifying cause, and oftentimes there are cases in which some part of the storm, or high, has its action below the mountain-peaks (I have found this true especially at Pike's Peak); but the larger commotions of the atmosphere may be profitably studied at such points.

In carrying out my studies on this problem, I have invariably sought for help from the original records, which are now so abundant at Mount Washington, Pike's Peak, and at many high stations in Europe, and I have massed thousands of observations bearing on the question. The first publication of these studies was in the *American Meteorological Journal* of August, 1886, in which I showed that the temperature observations at the base and summit of Pic du Midi, in France, indicated a decided rise at both points on the approach of a storm. In October of the following year I showed by the observations at Mount Washington that in both storms and highs there was the same fluctuation at the summit as on the base, and that the mean temperature of the air-column was ten to twelve degrees higher in storms, and the same amount lower in highs, than before or after the centre had passed.

It seems to me that the crucial test in Dr. Hann's recent work, which has attracted so much attention, must be the records at the mountain stations, and I believe that this will be insisted on by Dr. Hann himself as strongly as by any one. In fact, Dr. Hann has based all his work on his interpretation of the records.



TEMPERATURE FLUCTUATIONS, 1889.

Sonnblick, full curve; Salzburg, dotted curve.

It seems to me that he has given altogether too much weight to a few isolated cases, while he has ignored hundreds of cases which disprove his propositions. I have already shown in this journal for Sept. 5, 1890, that the evidence at Sonnblick is different only in degree from that in this country, and I have there explained how the peculiar results in the remarkable high of barometer, 1889 (which, in fact, was the only one in three years exhibiting such discordances from the usual law), might be accounted for. I have now made a special study of the storm of Oct. 1, 1889, which Dr. Hann advanced as favoring his view, that the temperature in a storm falls as we rise in its centre, and at some height is lower than that of the surrounding region. The results of this investigation so remarkably corroborate my position, that I present a copy of the curves in order that others may see the exact state of the case.

These curves are constructed as follows. The lower or full curve represents the temperature observation for each day at Sonnblick, 3,095 metres (10,154 feet), at 9 P.M., at which time very nearly the mean for the twenty-four hours occurs; and the upper or dotted curve shows the temperature at precisely the same time at Salzburg, just north of Sonnblick, at a height of 437 metres (1,434 feet). I have given the curves from Sept. 13 to Oct. 5, including the storm of the 1st. It will be seen that there is a most remarkable accordance between these curves; almost every bending at the base is faithfully reproduced at the summit; and, if any thing, there is generally a greater fluctuation on the mountain than on the plain. This is not all, however. Examining the very date under discussion, Oct. 1, we find that at Sonnblick the temperature began rising on Sept. 29, and in twenty-four hours had risen

4.2° C. (7.6° F.); in the next twenty-four hours it fell 1.4° (2.5° F.), and then fell 3.2° (5.8° F.), or a fall of 8.3° F. in forty-eight hours. It seems to me that no more positive disproof of Dr. Hann's position could be found than these very observations which have given rise to so much discussion. Here is the temperature higher in the centre of a storm than before and after it, both at base and summit, exactly in accordance with theory, and directly opposed to Dr. Hann's position.

Dr. Hann has tried to fortify his position by stating the fact that in this storm the average temperature was 4° C. below the thirty-years' normal, and this temperature was lower than that in a high, nearly two months later. As I showed in this journal for June 6, 1890, "the temperature in a vertical direction in a storm is not fixed, but may be ten degrees, or even more, lower than the average, and yet be many degrees above that of the surrounding region. That the temperature in an October storm was lower than in a November high area is not in any wise remarkable." This position is exactly the one taken more recently by Professor Ferrel (*Science*, Dec. 19); so that we see that on all accounts Dr. Hann's position is entirely untenable, and his disproof of the condensation theory, if it amounts to any thing, is a direct proof in its favor, as shown by the records.

H. A. HAZEN.

Washington, Jan. 7.

The Practicability of transporting the Negro back to Africa.

A LITTLE more than a year ago there appeared in the columns of *The Open Court* of Chicago some very excellent articles upon the question as to the methods we should adopt in handling our African population in the future. There were two sides taken in the premises,—those in favor of making the attempt to assimilate this mighty host of millions of negroes we now have in our midst; and those in favor of sending him back to the land of his ancestors. In the opinion of the present writer, the most able of all these articles came from the pen of Professor Cope, and in the main we completely coincide with the views that that far-seeing thinker puts forth.

Professor Cope's reasons for returning the African to Africa are most cogent indeed, and are stated in a philosophic and masterly manner. He lifts himself far above the state of the case as seen by the short-sighted party politician, or the sentimental hopes of the idealist or philanthropist, and, calling history and science to his aid, shows most conclusively that we incur a great danger in quietly submitting to the continued presence of this race of people among us. It is not my object here to enlarge upon his ably stated argument, for he has shown with marked precision and strength the dangers of hybridization of the white and black races in this country, and the constantly disturbing element the negro is in our national organization. By far the greatest danger, however, comes from the mixture of the two races; and that such is now going on, one has to but study the population of a city like Washington to appreciate.

It is to be most devoutly hoped that in the very near future the pressing necessity of taking early action in this matter will be fully recognized; and, when such comes to be the case, the practical question will surely arise as to the best ways and means of accomplishing the transfer. Little has been written upon this point as yet, though we all know that the proper exercise of ability, of energy, and the use of sufficient money, will effect it. It seems to me that the first steps that should be taken are those of an organization of an extensive American expedition to Africa, to primarily report upon the best available areas for colonization, taking conditions of climate and for future improvement into consideration. Such an expedition would have many decided advantages; for, in addition to making a well-organized initial move for the removal of the negro to his proper home, it would give America an opportunity to reap the national benefits that flow from such exploration,—credit of a nature that we now stand greatly in need of, as our last African expedition was practically a puerile failure. Finally, it would give scientific employment to several of the huge and expensive battle-ships we are now constructing, and for which there is no other especial employment in these days of peace, beyond an exhibition of power.

The next step should be in the direction of constructing a sufficient number of comfortable and commodious steamers by means of which the transfer could be made; and upon their completion, the necessary national legislation should be promptly enacted that would efficiently result in the removal of every negro in this country to those parts of the African continent selected for them. The settlement for such personal properties as the comparatively few negroes could justly lay claim to in the United States could be easily settled. It would not create a circumstance aside similar financial problems that we have most promptly and satisfactorily solved in former times.

We do not need the negro vote; we do not need his labor; and, least of all, do we need the injection of his lowly blood into our veins. On the other hand, "Darkest Africa" can well stand, and with the greatest benefit, the introduction into her fertile valleys and upon her fair hillsides, of the very material she most requires to inaugurate her development; that is, several millions of the descendants of her people, which, for a century and a half, have enjoyed the tuition of the most highly civilized race upon the face of the globe.

R. W. SHUFELDT.

Takoma, D.C., Jan. 2.

["Letters to Editor" continued on p. 50.]

NOTES AND NEWS.

AN exhibition at Grolier Club, 29 East 32d Street, New York, of books on alchemy and early chemistry belonging to Dr. H. C. Bolton, is announced to close Monday, Jan. 26; open afternoons from two to six o'clock.

—Dr. Don José Nicolás Gutierrez, founder of the Cuban Academy of Medical, Physical, and Natural Sciences at Havana, died Dec. 31, 1890, at the age of ninety. The rector of the university, and Professor Poey of the same, still live,—one at the age of ninety, the other ninety-one.

—Owing to their greatly increased trade in New York, George L. English & Co., mineralogists, have leased rooms at 733 and 735 Broadway (within three doors of their former location), in which they have more space than heretofore in their Philadelphia and New York stores combined. The consolidation of the two stores, and the formal transfer of the business, were made on Jan. 1. Mr. Niven, a member of the firm, started Dec. 13 on another collecting-trip to the South-west and Mexico.

—The question has been asked, "Does the weather of Kansas divide itself into seven-year wet and dry periods?" Another question that has been asked, and it is an important one too, is, "Is the rainfall of Kansas increasing?" And it is the object of a paper by E. C. Murphy, C.E., Kansas University, Lawrence, Kan., to answer these questions as correctly as the rainfall records of the State will permit, in which he concludes from the record of the observations thus far taken, that the law of seven-year wet and dry periods does hold in Kansas, and also that the rainfall is steadily increasing in Kansas.

—The next meeting of the American Branch of the Society for Psychical Research will be held at the Association Hall, corner of Berkeley and Boylston Streets, Boston, Mass., on Tuesday, Jan. 27, at 8 P.M. The following papers will be read: "Report of Some Recent Experiments in Automatic Writing," by T. Barkworth, to be read by the secretary; "Report of Some Sitzings with Mrs. Piper in America," by R. Hodgson. No admittance except by ticket. Extra tickets may be obtained by members or associates on application to the secretary, Richard Hodgson, 5 Boylston Place, Boston, Mass.

—Staff-Commander J. G. Boulton, R.N., who has, since the autumn of 1883, been engaged in a hydrographic survey of the Georgian Bay, during the past season completed a large proportion of the work yet remaining to be done, being that part of the east coast from Indian Islands to Moose Deer Point, and including the important harbor and approaches of Parry Sound. The part not yet completed comprises the south-east extremity of the bay, lying south-eastward of a line joining Moose Deer Point and Point Rich, of which the most important portion is Matchedash Bay. Two charts have just been issued by the British Admiralty, covering the work done by Capt. Boulton in 1889. One of these embraces

the coast from Collins Inlet to McCoy Islands, including the harbors of French River, Byng Inlet, and Point au Baril. In consequence of the shoal water, low land, and innumerable islands in this sheet, navigation is very difficult, and the extremely broken character of the coast line shows the immense quantity of work involved in making a thorough survey of this district. The second chart referred to shows St. Joseph's Channel north of St. Joseph Island, and will be of great use to American as well as Canadian shipping. It includes the western limit of Capt. Boulton's work, the west extremity of the sheet connecting with the American Coast Survey charts.

—At the meeting of the French Academy on Dec. 8, as we learn from *Nature* of Jan. 1, 1891, M. Mascart presented a work by Gen. A. de Tillo on the distribution of atmospheric pressure in the Russian Empire and Asia from 1836 to 1885. The work consists of an atlas of 69 charts, and a discussion of the monthly and annual values, as well as of the variability of pressure, and the relations existing between the variations of pressure and those of temperature at 136 stations. The highest pressure quoted is 31.63 inches (reduced to sea-level), in December, 1877, at Barnaoul; and this is stated to be the highest reading on record. But in the *Quarterly Journal of the Royal Meteorological Society* for July, 1887, Mr. C. Harding quoted, on the authority of Professor Loomis, a reading of 31.72 inches on Dec. 16, 1877, at Semipatalinsk. In *Nature*, vol. xxxv. p. 344, Mr. Blanford quoted the lowest reading on record at any land station, viz., 27.12 (reduced to English standards), which occurred on Sept. 22, 1885, on the coast of Orissa. These readings give a difference of 4.6 inches, probably the maximum range of the barometer ever observed at the earth's surface.

—A microscopical study by Herr Schultz, of the skin of toads and salamanders, has yielded some interesting results. As stated in *Nature*, there are two kinds of glands,—mucus and poison glands. The former are numerous over the whole body; while the latter are on the back of body and limbs, and there are groups in the ear-region behind the eye, and in the salamander at the angle of the jaw. The mucus-glands are spherical, have a clear, glassy appearance, and contain mucus-cells and mucus: the poison-glands, which are in regular strips on the salamander, are oval, much larger, and have a dark, granular look, from strongly refractive drops of poison, a good re-agent for which is copper-hæmatoxylin. The poisonous elements are from epithelial cells lining the glands. The mucus-glands are for moistening the skin; and the liquid has no special smell, nor a bitter or acid taste. The poison-glands are, of course, protective; and the corrosive juice is discharged differently in toads and salamanders, on stimulating electrically. In the latter it is spirted out in a fine jet, sometimes more than a foot in length; whereas in the toad, after longer action of the current, it exudes sparingly in drops. The physiological action of the poison has lately been studied by some Frenchmen. There is no reason, according to Herr Schultz, for supposing that the mucus-glands sometimes become poisonous.

—At a meeting of the Biological Club of Columbus, O., Jan. 5, Professor Lazenby gave a report of the twenty-fourth annual meeting of the Ohio State Horticultural Society, recently held at Zanesville, saying that the principal interest seemed to centre in three subjects,—new varieties of fruits; the use of fungicides; and cross-fertilization, especially between the peach and cherry. It was the decision of fruit-growers present that for them the older, standard varieties are still much better than many of those of only recent advent in the horticultural world. For the parasitic fungi, which do such great injury to many of our fruit-trees and vines, it was recommended to spray with a solution of sulphate of copper and ammonia. All the difference in a fruit-crop between success and failure may be seen by comparing those orchards and vineyards which have been sprayed with those which have not. For cross-fertilization it may be said that the experiment of crossing the peach and cherry was successful in eleven instances last spring at the Ohio State University. Mr. W. C. Werner next spoke of the varieties of the beautiful little evergreen, much used for hedges, the arbor-vitæ (*Thuja occidentalis*). Mr. C. P. Sigerfoos described two Indian graves recently opened in a gravel-pit near the western extension of Lane Avenue at

North Columbus. These graves were in a cultivated field situated on a promontory near the Olentangy River at the new bridge just above the college farm. One contained the skeleton of a man about twenty-five years of age, and the other that of a woman of about sixty years. Each had evidently been buried in a sitting posture; and the hand of the man was supported toward the mouth with a mussel-shell near it, as though it had been intended to serve as a drinking-vessel for the entombed individual on his journey to the land of the Great Spirit. The bottom of this grave was at least seven feet beneath the surface of the ground, so the head was covered by about three feet of soil. For about one foot under the skeleton was found disturbed gravel and dirt, and beneath this was yet two or three inches of ashes and cinders. The charcoal, one piece being two and one-half feet long, showed that there had been a fire which was smothered by the material thrown over it. The woman's grave showed no evidences of fire beneath it, although such were found above in the form of cinders mixed with the material with which the grave was filled. No relics whatever were found excepting some pieces of pottery in each grave.

—In a report to the British Foreign Office, recently published, Col. Stewart, the British consul-general at Tabreez, calls attention to the curious system of lakes in that region, situated at a great elevation above the sea-level. According to *Nature* of Jan. 8, these are the lake of Urumia, situated 4,100 feet above the sea, Lake Van, and the Guektcha lake. Lake Van is in Turkish territory, and the Guektcha lake in Russian territory, though both are near the bottom of the Persian province of Azarbaijan, in which is situated the lake of Urumia, the largest and most important. It is 84 miles long and 24 miles broad, and is probably the saltiest piece of water on earth, being much saltier than the Dead Sea. The water contains nearly 22 per cent of salt. Its northern coasts are incrustated with a border of salt glittering white in the sun. It is said that no living thing can survive in it, but a very small species of jelly-fish does exist in its waters. Many streams pour down from the Kurdish Mountains, which border Turkey, and render the country between them and the lake of Urumia very green and fertile. This part of the country looks more like India than Persia, but the climate is severe in winter. The whole country being situated from 4,000 feet to 5,000 feet above ocean-level, the snowfall in winter is great. At night in winter the thermometer falls frequently below zero of Fahrenheit, but in the day-time it rises considerably, generally reaching 28° or 30°, and this with a bright sun over head. Many people are frozen to death on the roads in winter while crossing the various passes. The winter climate may be compared to that of Canada, but the summer approaches that of northern India.

—The wren is generally supposed to be a gentle little bird, yet on occasion it seems capable of displaying any thing but an amiable temper. In the *Selborne Society's* magazine, Mr. Aubrey Edwards gives from his note-book the following account (quoted in *Nature* of Jan. 1) of what he calls "a disgraceful scene" between two male wrens: "April 15, 1889.—I have just been watching two golden-crested wrens fighting. They first attracted my attention by getting up from the ground almost under my feet, and engaging again and falling to the ground. Then rising again, one chased the other into a yew-tree near, where I had a good close view of them as they challenged each other, ruffling their feathers, shaking their bodies, singing and dancing about with crests erected, the sun shining on the orange-colored crests,—such a pretty sight! After they had been talking big at each other for some minutes, the hen arrived on the scene, and a desperate fight ensued, the two cocks falling to the ground in fierce embrace, rolling over each other occasionally, but for the most part lying still on the ground with their claws buried in each other's feathers for about a minute. The hen was close by them on the ground, moving about, and looking very much concerned at the affray. Her pale-yellow crest contrasted notably with the rich orange of the males. After getting up, renewing the combat in a currant-bush, falling again, and struggling on the ground, they rose and had a chase round the yew-trees, the hen following to see the fun, and presently went off and were lost to view."

SCIENCE:

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Attention is called to the "Wants" column. All are invited to use it in soliciting information or seeking new positions. The name and address of applicants should be given in full, so that answers will go direct to them. The "Exchange" column is likewise open.

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THE NEW YORK *Evening Post* published, in its issue of Jan. 9, a letter from Cornell University which has a singular tone, and makes most remarkable statements. It asserts that some of the ablest professors in the literary branches of the university are proposing to resign, because, as they state, they are unable to see that progress in their own departments which has for some years past distinguished the technical schools of the university. It is said, that, although the academic departments have been continually strengthened by the addition of new departments and of able men to the staff of professors and instructors, these departments still fall behind the others in their rate of growth. This state of things is attributed to the fact that the price of tuition has been increased, though it is not stated why this increase should affect their departments more than others. In all institutions of learning the cost of the technical instruction has been from the first, both to the institution and to the student, greater than purely literary instruction; and the flocking of students into them, in spite of this disadvantage, is as observable in other colleges as in that from which this curious complaint comes. The real state of the case is, we are confident, that the establishment of technical education meets the need and fulfils the desires of a very large proportion of young men who have no inclination to defer going into business for the purpose of getting an education of the older sort, — a mistake, we think, — but who are keen enough to see that certain branches of business must be most successfully pursued by

those who have had the professional preliminary training, not education in the usual sense of that term, which is required to give the novice a good hold upon its principles and practice. The profession of engineering, for example, has become a learned profession; and the graduates of these professional schools are more carefully and remorselessly sorted out from the great mass than are those who desire to enter either of the older, so-called learned professions. Engineering schools often graduate not more than one-third their entering classes. It is not at all likely that acute and learned professors are proposing to leave any such good positions as are held at Cornell, or other great universities, on this account. The fact is, that the state of things noted is perfectly natural and proper; and the result is, that every professor of ability and ambition takes advantage of his good fortune in having smaller classes to prosecute his studies and his researches, and thus to teach the world, as well as his own students, both better and more widely. Any such positions vacated in any of our colleges will be gladly taken by brighter men who seek just this opportunity.

LETTERS TO THE EDITOR.

[Continued from p. 48.]

The Skeleton in Armor.

PROFESSOR ANDERSON was correct in saying that the skeleton, immortalized by Longfellow, was discovered at Fall River, Mass., in 1831; and not in 1837, as Mr. Beauchamp states on p. 26 of your last number (Jan. 9, 1891).

The actual date of the discovery was April 26, 1831, and the earliest account of it was published in *The American Magazine*, vol. iii. p. 434 (August, 1837). This was copied into Barber's "Historical Collections for Massachusetts," p. 123; and from that source Col. Stone transferred it to his "Life of Brant." This may account for Mr. Watson's having omitted Stone from his list of authorities. Subsequently, in 1839, several other skeletons were discovered in about the same locality, near the boundary-line between Fall River and Tiverton, R.I., accompanied by precisely similar objects as the first. The original skeleton, which had been preserved in the Museum of the Troy Athenæum ("Troy" was the old name of Fall River), was destroyed by a fire about the year 1843. Some of the relics discovered with the skeletons disinterred in 1839 are now to be seen at the Redwood Library in Newport. These different discoveries of similar interments, some years apart, have occasioned the confusion of dates.

A few years ago a skeleton was discovered at Centreville, on Cape Cod, with a brass breastplate precisely like the one originally found in 1831. This is described by Henry E. Chase in the "Smithsonian Report," 1883, p. 902.

It is worth noticing, that besides the "flat, triangular arrow-heads of sheet copper," to which Mr. Beauchamp refers as having been recently found in the Iroquois district of New York, similar in shape to those made of brass disinterred with the skeleton in 1831, like objects, also made of sheet brass, have not infrequently been met with in other localities (see ABBOTT'S *Primitive Industry*, p. 420; JONES'S *Antiquities of the Southern Indians*, p. 251; *Reports of the Peabody Museum*, ii. p. 732, iii. pp. 35, 195; *Reports of Long Island Historical Society* (1878-81), p. 40; *Smithsonian Report*, 1883, p. 901).

We learn whence the Indians procured the brass of which these arrow-heads were fabricated, from the account given in Underhill's "History of the Pequod War" (*Collections of Massachusetts Historical Society* [3d series], vol. vi. p. 17), who tells us that a Dutch trader was prevented from bartering with the Pequods on the ground that they were to be supplied in part with "kettles, or the like, which make their arrow-heads." Sir Ferdinando Gorges, earlier than this, had complained about "disorderly persons," who sold the savages "arrow-heads and other arms" ("Description of New England," *ibid.* p. 70).

The earliest notices of the Indians often speak of their arrows as being headed with brass. This was the case with those "taken up" and sent to England in the first encounter of the Pilgrims

with them (MOURT'S *Relation*, p. 55 [Dexter's edition]). William Wood (*New England's Prospect*, part ii, chap. xvii, p. 101) speaks of them as made of this material: so does the Rev. Francis Higginson ("New England's Plantation," in YOUNG'S *Chronicles of Massachusetts*, p. 257).

Undoubtedly the Indians found it easier to cut up brass kettles for this purpose than to pound out with their stone hammers pieces of native copper. This they were in the habit of doing, according to Brereton ("Brief and True Relation of the Discovery of the North Part of Virginia," in *Collections of Massachusetts Historical Society* [3d series], vol. viii, p. 91).

HENRY W. HAYNES.

Boston, Jan. 13.

Meteorology and Mathematics.

AT a time when the tide of meteorological controversy in your columns runs high and the general outcry is for revision of the old theories,—all apparently because Dr. Hann last spring made some erroneous deductions from observations in the Alps, which has not convinced anybody (*vide* Hazen),—you may permit me to add my small share to the general conflagration, out of the ashes of which the true Phoenix may some day be expected to rise in all its glory.

What I here wish to sacrifice on the altar of truth is the so-called mathematical treatment of the circulation of the atmosphere; and I take occasion from a letter by William Ferrel in your issue of Jan. 2, wherein the writer complains that Dr. Hann has never attempted to show that his results have been deduced from erroneous principles or processes.

I am not aware that any mathematician has ever attempted to show, on rational mechanical principles, what would be the motion of a body of air moving over the surface of a rotating globe,—not over the free and empty surface, but on the bottom of the air universally enveloping and rotating with this globe, being part and parcel of this air itself,—but I think it can be shown, by looking ever so little into the true nature of this subject, that the problem is far more complicated than Professor Ferrel seems to imagine.

As the speed wherewith places at different latitudes on the earth's surface rotate differ in proportion to their distances from the axis, so it is concluded by Ferrel and others that a particle of air is deflected towards the east when moving towards the poles, and towards the west when moving towards the equator.

In proportion, however, as the speed of rotation of the particle of air changes while it moves from latitude to latitude, so also the centrifugal force to which it is exposed changes; and therefore, if a change in the former should have the effect of deflecting a current of surface air laterally, so also the effect of the latter must be to deflect the current in a vertical direction. The result hereof is that all pole-bound currents should appear as upper currents, and the surface wind should always be directed more or less towards the equator, and never in the opposite direction. This, however, does not agree with observations. There is a continuous current of surface air round the border of any anticyclone, while in strict consequence of Professor Ferrel's theory we should only expect to find this current round one-half the circumference of the high pressure, the other half being deflected into an upper current.

According to the way the writer was taught applied mathematics (a discipline, by the way, incomparably more difficult to master than mathematics itself), it is not admissible to pick out one of the forces acting upon a body in motion, and ignore another of equal importance, simply because it does not suit our purposes.

In a paper, "On the Cause of Trade-Winds," read before the American Society of Civil Engineers Dec. 18, 1889 (see "Transactions," vol. xxiii, August, 1890), the writer allowed himself to suggest how the gyratory motion of the surface air might be accounted for independently of a supposed effect of the earth's rotation, which theory, as we have just seen, doesn't bear closer inspection; and one of America's most eminent engineers, Mr. Charles Macdonald, got up at the meeting, and declared the explanation given the only rational one he had ever heard, and well

worth the most careful study. I therefore beg to call the reader's attention to the contents of this paper; and, by comparing my diagrams with the isobaric charts over the North Atlantic for the autumn of 1889, he may see the reason why Dr. Hann found the temperature of the anticyclonic air in the Alps so exceptionally high.

FRANZ A. VELSCHOW, C.E.

Brooklyn, Jan. 7.

The Education of the Deaf.

SPOKEN language is the product of the mind enjoined with the enjoyment of all the senses. Its acquisition is facilitated through the sense of hearing, but the latter is not indispensable to it; and to its reproduction by the deaf (without its musical intonation) a normal throat and mouth are requisite. Dr. Gillett says, "This [intelligence] the deaf-mute has perfectly" (*Science*, Dec. 26, p. 355). As most of the deaf possess these requirements, the question that now arises is this: "Is it expedient to invent an artificial sign-language, which of course presupposes articulate speech, in order to impart the latter to the deaf?" Emphatically, no. The oral schools now in existence in this country prove this fact beyond the shadow of a doubt. One of Dr. Gillett's objections is this: "For, while he [the deaf] may utter distinct articulate sounds for others to receive, he cannot receive them himself, and is consequently thrown back upon the visible movements of the superficial parts of the organs of voice, which are chiefly the lips" (*Science*, Dec. 26, p. 357). The deaf will read from the lips-mouth readily when spoken to without voice, that is, mutely; and it is a phenomenon that they are enabled to recognize even the distinction between being addressed audibly and mutely. They will often converse mutely with each other in the school-room, when desirous of not being overheard by their teacher. Lately one of my patients happened to be a Chinaman. On inquiring of him what he uses at his meals, — a fork and a knife, or chop-sticks, — he said that at home he uses the latter, but when eating at a restaurant he uses the former. Early education and impressions are lasting. The same is applicable to those mutes who are educated by the combined system, where an artificial sign-language forms the basis of instruction. When a mute educated by that system meets a deaf-mute who was taught by the oral system, the former will naturally address the latter by signs. To start the conversation, the first question perhaps will be, "Do you know Mr. P—t?" The sign for "Mr. P—t" is this: closing the thumb and all the fingers except the forefinger, with which he taps himself at the temple. The other repeats the sign for "P—t," shakes his head, and indicates by expressions that he does not know what this sign means; then the former spells with his fingers the words "P—t, teacher;" and such conversations may occur so often that the one learns the meaning of signs from the other. The deaf educated by the oral system become so ambitious that they make efforts when in a small circle of society, by constant watchfulness, to follow the connection of the conversation, and try to hide their infirmity. They are even ashamed to use signs. I would gladly go extensively into the details of Dr. Gillett's article on the education of the deaf, but the pressure of professional duties will not permit me to devote the time necessary. I would like, though, to direct Dr. Gillett's attention to Hon. Gardiner G. Hubbard's article in *Science* of Dec. 19, to which I have to make the one exception only, that the first oral school in this country was established in this city, and was in operation in the fall of 1864 at No. 427 (old number 415) Eighth Avenue, consisting of two boarding and three day pupils.

B. ENGELSMAN.

New York, Jan. 8.

BOOK-REVIEWS.

The Science of Fairy Tales. By EDWIN SIDNEY HARTLAND. New York, Scribner & Welford. 12°. \$1.25.

THIS volume is the latest issue in the Contemporary Science Series, and may be described as an attempt to group and classify the various stories of Celtic and Teutonic origin relating to elves and fairies, with illustrations from the stories of other nations. Mr. Hartland opens his work with a few remarks on savage ideas,

especially on the subject of spirits, and then proceeds to relate a large number of the tales, grouping them so far as possible, and aiming particularly to show how similar they are all the world over. The first class of stories dealt with are those that relate how human midwives are often snatched away and taken to fairyland to assist at the birth of fairy children. Then come the stories of changelings and babies stolen by the fairies, followed by tales of other robberies by the fairy-folk, as well as of robberies perpetrated or attempted by mortals against the fairies. Stories of men being put to sleep for years and even centuries, as in the case of Rip Van Winkle, occupy a considerable space, and the list is completed by two chapters on the swan maidens.

Thus the greater part of the book is taken up with the tales themselves, and we are rather disappointed at the meagre attempts to explain them. A few discussions appear here and there, and a brief concluding chapter sums up the author's theories, so far as he has any theories to offer; but one cannot help feeling as he closes the book that the "science of fairy-tales" is as yet hardly entitled to that name. Mr. Hartland has indeed marshalled a great body of facts on his chosen theme, and his book is written in a style that will make it attractive to all that are interested in its subject. But it must be remembered that facts are not science,—they are only the materials of science,—and that the real aim of the scientist is to explain the facts. Mr. Hartland shows very clearly that folk-tales bear a similar character everywhere, and that they must therefore be attributed to certain intellectual and moral characteristics common to all tribes of men; but what those characteristics are he does not even inquire. He ascribes the origin of the tales to the primitive belief in spirits,—but that is merely using the genus to account for the species,—and gives no real explanation at all. It is evident that the most difficult work connected with the subject is yet to be done; but meanwhile those who wish for a large and well-arranged collection of the facts will find it in the book before us.

Educational Review. Vol. I. No. 1. January, 1891. Ed. by NICHOLAS MURRAY BUTLER. m. New York, Henry Holt & Co. 8°. \$3 a year; 35 cents a number.

The Pedagogical Seminary. Vol. I. No. 1. January, 1891. Ed. by G. STANLEY HALL. Worcester, Mass., J. H. Orpha. 8°. \$4 a year; \$1.50 a number.

WE have had in this country for many years a number of educational periodicals, but they have been of inferior character, and some of them practically worthless. There is room, therefore, for a new and better one; and the general interest now manifested in educational matters makes the present an opportune time for starting such a work. Two journals of the kind have now appeared in magazine form, one from a private publishing-house, the other from Clark University; and even a slight examination will show that they are superior to any thing of the sort that we have had in America hitherto. Whether and how far they will supply the existing need cannot be determined from the contents of the first numbers; but these give evidence of thought as well as of reading, and show that the editors of both are in earnest in their new undertakings. They are, however, quite different in character, and we shall therefore consider them separately.

The *Educational Review* opens with a number of essays; then follow brief discussions, editorial and otherwise; next comes a series of book-notices; and, last of all, a few extracts from foreign periodicals. Most of the articles are fairly well written, though none have any special merit of style, and some contain suggestions and criticisms of real interest. The book-reviews are similar to those that appear in the best newspapers, and will doubtless prove an attractive feature of the magazine. The notes and discussions present some good points, but one or two of those in the editorial department are marred by too much dogmatism. The least successful papers are the essays, not one of which is really satisfactory, their brevity being inconsistent with a proper treatment of their respective subjects, while most of them have the air of having been written to order. President Gilman writes on "The Shortening of the College Curriculum," intimating his opinion that it can perfectly well be shortened, but without suggesting any thing very definite. William T. Harris contributes a strangely narrow and

shallow article on "Fruitful Lines of Investigation in Psychology," and also a book-review of similar tenor. We hope that these articles are not a sample of the way the *Review* will treat philosophical themes. "Is there a Science of Education?" by Josiah Royce, is the first of a series of articles, and contains little besides vague generalities; but the author promises in future numbers to treat some more definite aspects of his subject. Superintendent Andrew S. Draper discusses "The limits of State Control in Education," and makes some suggestive remarks; but his paper is far too brief for a proper treatment of its theme. The last of the essays is by Charles de Garmo, on "The Herbartian School of Pedagogics," and bids fair, when completed, to give a good synopsis of Herbart's views; though whether these views are of much value admits of question. On the whole, the *Educational Review* bids fair to be useful; but we hope to find the essays in future numbers more elaborate and thorough.

The *Pedagogical Seminary* consists in the main of notes on the educational systems and theories of other countries. It opens with an editorial on the aim and purpose of the *Seminary*, followed by a paper, also from the editor, on "Educational Reforms;" while the rest of the number is mainly devoted to the study of recent changes in the schools and universities of foreign countries, and of foreign discussions on educational topics. The editor and his associates seem to desire and anticipate great changes and reforms in our own educational system, especially in its higher departments; but they leave us in great uncertainty as to what specific changes they wish for. However, they have here collected a mass of information which can hardly fail to be useful to educators, and which may suggest beneficial reforms in our schools. One cannot help asking, though, why President Hall and his associates have started this little publication of their own, when the *Educational Review* would have served them well as a medium for addressing the public. As the *Seminary* is to be published only three times a year, it will not contain a great deal of matter, and its fusion with the *Review* would seem to be easy as well as desirable. But however published, and from whatever source they may come, real contributions to our educational literature are certain to be welcome.

The Future of Science. By ERNEST RENAN. Boston, Roberts. 8°. \$2.50.

THIS book is not just what its title would lead us to expect. It contains very little about physical science, and nothing whatever about its future: on the contrary it relates almost exclusively to the sciences of mind and society, and the future of religion. M. Renan takes the ground that the highest degree of intellectual culture is to understand humanity, and this work is written from that point of view. It is not a new work, however, but was composed forty years ago, when the author was young; and it has many of the characteristics that we should expect to find in a work coming from such a source. It is written in the author's usual diffuse and rambling style, and with rather more than his usual flippancy; and the views it expresses are those with which readers of his other books are familiar.

M. Renan starts with the assumption that "there is no such thing as the supernatural," and consequently that every thing that has hitherto been called religion is destined to pass away. "The religion of the future," he says, "will be pure humanism." God is "the category of the ideal." "In the future the word 'morality' will not be the proper word. . . . I prefer to substitute the word 'æstheticism.'" In short, to lead an intellectual life and pursue the scientific and artistic ideals is the only religion that is now left to us. Such is the opinion of M. Renan, which he reiterates without the least suspicion that he may be mistaken. Moreover, it appears that he himself, even at the age of twenty-five, had already reached perfection; for he says, "I, as a man of culture, do not find any evil in myself, and I am impelled spontaneously towards what seems to me the most noble. If all others had as much culture as myself, they would all, like myself, be incapable of doing an evil act" (p. 333).

But our readers must not suppose that the book contains nothing better than the above-quoted passages. On the contrary, when the author leaves the question of the future religion, and talks

about history and philology, the importance of criticism, and the need of educating the masses, he says much that is interesting and valuable. The necessity of examining and criticising traditional views is strongly emphasized, and the great value of philology as an instrument of such criticism is clearly shown. The history of religions is mentioned as one of the most important subjects of investigation; and it appears that the author had, even at that early age, projected his work on the origins of Christianity. Plutocracy is declared to be the main cause of our slow intellectual development; yet wealth is recognized as essential to culture, and endowments for investigators are advocated. The finest passage in the book is that in which the author pleads for the intellectual culture and elevation of the masses, which he deems perfectly feasible; but in his preface, which was written quite recently, he intimates that on this point, as on some others, he had been too optimistic. On the whole, though the book contains some excellent passages and useful suggestions, it will not add to the world's knowledge nor to the author's reputation.

AMONG THE PUBLISHERS.

ANOTHER proof that American scientific work is appreciated abroad is shown by the translation, by Dr. Victor von Richter of the University of Breslau, of a handbook of electro-chemical analysis, recently issued in Philadelphia by Professor Edgar F. Smith of the University of Pennsylvania.

—Mr. F. G. Barry has sold his monthly magazine, *College and School*, to Louis Lombard of Utica, N.Y. The next number will appear Feb. 15, entitled *The Louis Lombard*.

—P. Blakiston, Son, & Co., Philadelphia, have just issued a second edition of "Diseases of the Digestive Organs in Children," by Louis Starr, M.D., and of "Water Analysis for Sanitary Purposes," by Drs. Leffmann and Beam, both containing new material and many additional illustrations. They have also just ready "Gynæcology," being No. 7 of their compend for medical students.

—J. Scott Keltie, librarian of the Royal Geographical Society, London, will have an article, "About Africa," in the February *Scribner*, with the London African Exhibition for a text. A rare portrait of Livingstone, taken in 1860, will be the frontispiece of that issue, and the article will contain several portraits (never before engraved) of African explorers, from the private collection of John Murray, Esq., the London publisher.

—Sir Edwin Arnold, describing a Japanese dinner, says, in the February *Scribner*, "You are at last surrounded by twenty or thirty dishes, like a ship in harbor by a fleet of boats; and the best of a Japanese dinner is, that, after flitting like a butterfly from flower to flower of the culinary *parterre*, you cannot only come back to any thing that has originally pleased, but leave off to smoke and chat, and then commence again, if you like, at the very beginning. When everybody has had enough, particularly of saké, the substantial part of the repast has still to arrive, for the Japanese. The last saké bottle is removed and *gohan* is brought, the honorable, great white tub with hot, boiled rice. Along with it re-appears fresh tea; and each native guest will consume two bowls of rice, and then another, amply saturated with tea."

—The February *Chautauquan* will contain, among other articles, "British India," by R. S. Dix; "England after the Norman Conquest," Part II., by Sarah Orne Jewett; "The English Towns," II., by Augustus I. Jessopp, D.D.; "A Peasant Striker of the Fourteenth Century," by Charles M. Andrews; "The Constitution of Japan," by William Elliot Griffis; "Studies in Astronomy," V., by Garrett P. Serviss; "The National Academy of Sciences," by Marcus Benjamin; "The Relation of the Family to Social Science," by John Habberton; "France in Tunis," by Edmond Plauchut; and "New England and Emigration," by Edward Everett Hale.

—The *Westminster Review* for January (Leonard Scott Publication Company, New York) opens with a paper on "Patriotism and Chastity," by Elizabeth Cady Stanton, for which recent events in Irish politics furnish a text. A paper on "A Privileged Pro-

fession" points out the advantage nursing offers to women. An exhaustive article on "The Decline of Marriage" deals with the relations between marriage and culture, and presents some conclusions that will attract wide attention. R. Seymour Long writes on the "Continuity of Parties in English History," and Frederick Dolman on "Hereditary Peers and Practical Politics." An essay on "The Social and Political Life of the Empire in the Fourth and Fifth Century," recalls the early days of this ancient though ever young review. In the department of "Contemporary Literature," books are reviewed in science, philosophy and theology, sociology, history and biography, and belles lettres. The number closes with its usual review of current English politics.

—Mr. Theodore Roosevelt has written for the Historic Towns Series, which Professor Freeman edits, and which the Longmans publish, the volume on "New York," to appear at once. Mr. Roosevelt shows incidentally that the admixture of races now to be seen in the city is no new thing, as the population was quite as heterogeneous in the beginning, and has been much the same at every stage of New York's growth.

—In *The Atlantic Monthly* for February, 1891, Professor Royce's second "Philosopher of the Paradoxical" is Schopenhauer. He treats Schopenhauer's place in the world of thought. Mr. Percival Lowell's "Noto" is continued, and the traveller at last arrives at the turning-point, but not the end, of his journey. Alice Morse Earle has a paper on "The New England Meeting-House," which is full of curious bits of information. Mr. Alpheus Hyatt writes on "The Next Stage in the Development of Public Parks," in which he advocates the allowance of space for a collection of living animals grouped for the uses of the student. William Everett has an article on "The French Spoliation Claims;" and Theodore Roosevelt, in "An Object-Lesson in Civil-Service Reform," tells about the work of the National Civil Service Commission for the last year, and its success in gaining a large number of applicants from the Southern States to enter the civil-service examinations.

—Messrs. E. & F. N. Spon (New York) announce an illustrated descriptive catalogue of their scientific publications relating to civil and mechanical engineering, arts, trades, and manufactures, which they will send on application; also a "Handbook for Mechanical Engineers," by Henry Adams; "The Municipal Buildings, Glasgow," by William Young, architect, with twenty colotype illustrations by Bedford, Lemere, & Co.; "Practical Electrical Notes and Definitions," for the use of engineering students and practical men, by W. Perren Maycock, together with the rules and regulations to be observed in electrical installation work, as issued by the Phoenix Fire Office and the Institution of Electrical Engineers (second edition, revised and enlarged); "Tables to find the Working Speed of Cables; comprising also Data as to Diameter, Capacity, and Copper Resistance of all Cores," by Arthur Dearlove (these tables have been computed from formulæ which have for some time been used by Messrs. Clark, Forde, and Taylor, and are based on the mean results recently obtained in the commercial working of long cables); "Light Railways as a Practical Means of Exploration," by E. R. Salwey, in which the author's desire is to bring prominently forward the suitability of narrow-gauge railways as an inexpensive and economical means by which countries already explored may be rapidly civilized, and their known resources developed; and "Surveying and Levelling Instruments Theoretically and Practically Described," by William F. Stanley.

—In the *Fortnightly Review* for January (Leonard Scott Publication Company, New York) A. Mounteney Jephson makes a new contribution to African literature in an article on "The Truth about Stanley and Emin Pacha," in which he refutes some charges brought against Mr. Stanley. Ernest M. Bowden writes on "Scientific Sins." E. B. Lanin, whose papers on Russia have been a strong feature in the *Fortnightly* in the past year, describes the country and people of Finland. Edward Delille presents some reminiscences of literary evenings in Paris, entitled "Chez Pousset: a Literary Evening." James D. Bourchier describes a voyage on the Black Sea with Prince Ferdinand, with accounts of Bulgarians and strange sights. Sir George Baden Powell writes on "The Canadian People," and considers the possibility of Can-

ada's ultimate absorption in the United States. Frederic Harrison has a brief paper on "The Irish Leadership;" and Irish affairs receive further consideration in an article by the Hon. Auberon Herbert, entitled "'The Rake's Progress' in Irish Politics."

—The next number of the "Publications of the American Academy of Political and Social Science" will contain an interesting article on "The Idea of Sovereignty," by Professor Ritchie of Oxford. It is specially flattering to Americans that so eminent an authority plants himself squarely on the doctrine of the sovereignty of the people,—an idea first advanced in modern times by American jurists. It is another evidence of how rapidly American political ideas are permeating and leavening European thought. Professor Ritchie is evidently a careful student of American constitutional development, and the academy is doing valuable work in introducing such authors to our American public.

—The *Nineteenth Century* for January, published by the Leonard Scott Publication Company, New York, begins the new year with a paper by the Duke of Argyll, entitled "Professor Huxley on the War-Path," in which the author takes the professor to task for some of his theological criticisms. Lieut.-Gen. Sir William F. Drummond writes on "Home Rule for the Navy," which, while especially a suggestion for the English Navy, is not without value to those interested in our own system. Lieut. W. G. Stairs contributes some leaves from his African diary, entitled "Shut up in the African Forest," relating some thrilling adventures and experiences while waiting for Stanley. H. Arthur Kennedy writes on "Velasquez and his King," with special reference to Philip and his encouragement of art. David F. Schloss discusses the merits of the Jew as a workman. Viscount Lymington presents some questions of forestry in an article on "Vert and Vener." The Earl of Meath describes labor colonies in Germany, with notes on a very interesting phase of social economy. Dr. George C. Kings-

bury has an article on "Hypnotism, Crime, and the Doctors," dealing with some questions of professional ethics. Norman Pearson writes on "Animal Immortality," and the number closes with a brief paper by Edward Dicey, on "The Rival Coalitions."

—Sir Morell Mackenzie contributes a review of Dr. Koch's "Treatment of Tuberculosis" to the *Contemporary Review* for January (Leonard Scott Publication Company, New York). The author points out the real merit of the discovery, and shows how erroneous it is to call it the "consumption cure." Professor Bryce's address before the Brooklyn Institute, on "An Age of Discontent," is also printed in this number. Frank H. Hill writes on "Home Rule and Home Rulers;" and politics are further considered in a paper by L. J. Jennings, entitled "Behind the Scenes in Parliament." R. Bosworth Smith discusses Englishmen in Africa, and what they have done there. Julia Wedgwood describes the revival of Euripides at Cambridge. The Rev. H. W. Clarke writes on "Public Landed Endowments of the Church." R. Anderson discusses morality by act of Parliament; and Professor J. Agar Beet, the certainties of Christianity.

—The next number of the "Annals of the American Academy" will contain an article by Professor Ashley of Toronto which will prove of special interest to all students of social economy. It is well known that Henry George, and the labor agitators and pessimists in general, delight in representing the condition of the workingman to-day as a sad one, to which he has been brought by the despotism of the better-situated classes. They refer with feeling to the ideal state of the English laborer in the fourteenth century, and contrast it with his present down-trodden condition. Professor Ashley deals this theory a ponderous blow, for he shows that the English laborer of that time was practically a slave, with no rights which his lord was bound to respect, and that, so far from his condition growing worse in the eyes of the law, it has steadily become better since that time.

Publications received at Editor's Office, Jan. 12-17.

- AMATEUR Electrician. Vol. I. No. 1. m. Ravenswood, Ill., Amateur Electrician Co. 16 p. 8°. \$1 per year.
- COLOR in the School-Room. A Manual for Teachers. Springfield, Mass., Milton Bradley Co. 12°.
- EDUCATIONAL Review. Vol. I. No. 1. January, 1891. Ed. by Nicholas Murray Butler, Ph.D. m. New York, Holt. 104 p. 8°. \$3 per year.
- HARTLAND, E. S. The Science of Fairy Tales. New York, Scribner & Welford. 372 p. 12°. \$1.25.
- HARVARD University Catalogue. 1890-91. Cambridge, Mass., The University. 444 p. 12°.
- HYATT, A., and ARMS, J. M. Guides for Science-Teaching. No. VIII. Insecta. Boston, Heath. 300 p. 16°. \$1.
- LADD, G. T. Outlines of Physiological Psychology. New York, Scribner. 505 p. 8°. \$2.
- MISSOURI Botanical Garden. St. Louis, State. 165 p. 8°.
- NORTH DAKOTA, First Annual Report of the Commissioner of Insurance of the State of. 1890. Bismarck, State. 443 p. 8°.
- NORTON, C. L. A Handbook of Florida. New York, Longmans, Green, & Co. 380 p. 16°. \$1.25.
- OHIO, First Annual Report of the Geological Survey of. Columbus, State, 1890. 323 p. Maps. 8°.
- PEDAGOGICAL Seminary, The. Vol. I. No. 1. January, 1891. Ed. by G. Stanley Hall, Ph.D. tri-m. Worcester, Mass., J. H. Orpha. 118 p. 8°. \$4 per year.
- RENAN, E. The Future of Science. Boston, Roberts. 491 p. 8°. \$2.50.
- STONE, A. Good Roads: How they can be had in Rhode Island. Salem, Mass., Salem Press Pub. Co. 23 p. 8°.
- U. S. Board on Geographic Names. Bulletin No. 1. Issued December 31, 1890. Washington, Smithsonian Inst. 13 p. 8°.
- U. S. NAVAL OBSERVATORY, Report of the Superintendent of the, for the year ending 1890, June 30. Washington, Government. 103 p. 8°.

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—D. C. Heath & Co., Boston, will at once add to their series of *Modern Language Texts*, Sandeau's "Mlle. de La Seiglière," with introduction and English notes by F. M. Warren, Ph.D., associate in modern languages in the Johns Hopkins University. This edition, of a text-book now recommended in the requirements for the New England colleges, is prepared with the demands of rapid reading in mind.

—Dr. Daniel G. Brinton of Philadelphia has now in press a work entitled "The American Race: a Linguistic Classification and Ethnographic Description of the Native Tribes of North and South America." It is the first attempt ever made to classify all the Indian tribes by their languages, and it also treats of their customs, religions, physical traits, arts, antiquities, and traditions. The work comprises the results of several years of study in this special field.

—The Scientific Publishing Company, New York, announce that they have acquired the copyright and plates of all the works of Dr. T. Sterry Hunt, and will hereafter have the exclusive sale of these admirable books. The works now ready are "Chemical and Geological Essays," second edition; "Mineral Physiology and Physiography," second edition; "A New Basis for Chemistry," third edition; and, now in preparation, "Systematic Mineralogy based on a Natural Classification."

—Sister Rose Gertrude, the young woman about whose work among the lepers of Molokai so much has been written, has been induced to reply to the charges made against her for renouncing her work. Her article, the first from her pen, is to be published in *The Ladies' Home Journal* for February, and will contain a full explanation of what she has accomplished among the lepers, and why she was obliged to forsake her work. As a sort of supplementary chapter to his "Looking Backward," Mr. Edward Bellamy has written an article for the same issue, under the title of "Women in the Year 2000," in which the famous nationalist

will sketch woman, marriage, courtship, etc., as they will be regarded in the year 2000. Emma C. Thursby, Clara Louise Kellogg, Madame Albani, Campanini, and Maud Powell will each have an article giving some vocal helps and musical hints to girls and women with musical aspirations.

—Messrs. Ginn & Co. announce "Sketch of the Philosophy of American Literature," by Greenough White, A.M. This essay aims, as its preface explains, to point out the connection between our country's literature and history, and to show how new forms in letters and arts have arisen as advancing thought required, — a task not attempted hitherto. It may be used as a key to the whole subject, as well as to the excellent and extended treatises upon it and the numerous compilations that have recently appeared. It is believed that it will interest the general reader (it can be read at a single sitting), and that the experienced teacher will find it highly valuable in inculcating in more advanced classes habits of sound and scholarly appreciation of American intellectual life.

—The good results which sometimes follow the combination of several competing business interests were the subject of some remarks by George R. Cathcart of the American Book Company, to a recent correspondent of the *New York Tribune*. This company is an amalgamation of three school-book publishing-houses in New York, and one from Cincinnati. When it was formed, the prediction was freely made that the price of school-books would go up. Mr. Cathcart says, however, that, so far from this being the case, their enlarged facilities have enabled them to put the price of school-books down from ten to twenty per cent. He further says that competing firms have been obliged to follow suit, with the result that the New York Board of Education, which buys \$50,000 worth of supplies from his concern; the Brooklyn Board, which purchases \$40,000; and the Philadelphia Board, which is a customer to the extent of \$30,000, — have all been benefited to the extent of many thousands of dollars.

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CALENDAR OF SOCIETIES.

Philosophical Society, Washington.

Jan. 17.—C. V. Riley, Bacteriology in Applied Entomology; H. A. Hazen, The Lawrence, Mass., Tornado of July 26, 1890; Asaph Hall, Note on (z) Cancri.

Women's Anthropological Society of America, Washington.

Nov. 8, 1890.—Mrs. Anita Newcomb McGee, The Papers presented before the Anthropological Section of the American Association for the Advancement of Science.

Nov. 22, 1890.—Clara Bliss Hinds, The Influence of Systematic Exercise upon Women.

Dec. 6, 1890.—Miss Cleveland Abbe, Psychology in its Physiological Analysis; Mrs. Thomas Wilson, The Béguinage of Ghent.

Jan. 3, 1891.—Miss Alice C. Fletcher, A Study of the Negro Race.

Jan. 17.—Miss Clara Rogers, The English Cottage System.

Boston Society of Natural History.

Jan. 21.—A. E. Dolbear, The Physics of Crystalline and Cellular Structure.

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